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THE MAGNITUDE OF THE AMERICAN MUNICIPAL WATER SUPPLY BUSINESS[1]

BY JOHN M. GOODELL[2]

Every water works superintendent knows that he is in charge of a plant representing a large investment, but it is doubtful if, in the daily demands for attention to a multitude of details, often small, he holds fast to his realization of the importance of the business he administers. It is the most important of all the public utilities and there is no branch of municipal affairs which surpasses it in intimate relations with the welfare of the community. It is so vital to the daily life of the city that the time has come when the public which owns the water works ought to be brought to a realization of the responsibilities it entrusts to its water works officials and shown the folly of denying to them the compensation and other advantages of men performing like work for private water companies and for other privately owned utilities.

Definite facts regarding the growth of the water supply business are difficult to obtain, especially in the case of the small cities, and even when obtained there is much uncertainty about the extent to which they are comparable. The United States Bureau of the Census collects statistics annually from all cities having a population of 30,000 or more. These are financial statistics and the last that have been made public are for the year ending June 30, 1918. This annual census is made under a special appropriation in which the work is limited to financial data and to cities of the size stated. The 1918 report is restricted, therefore, to the 227 cities of this class. The great number of small water works, public and private, cannot be estimated with any accuracy, but from all the sources of information available to the author it seems probable that there are between 7500 and 8000 works either publicly or privately owned which carry on a regular water supply business. In addition there is a considerable number of industrial plants which supply water to private consumers in their vicinity, sometimes without charge and sometimes at a small flat rate; occasionally these industrial supplies are quite large and there is a distinct question whether they should be regarded as public water supplies or as part of the housing and employment activities of the companies operating them.

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[1] In the JOURNAL of September, 1919, page 582, President Davis called attention to the desirability of collecting the more important data relating to water works in the United States through the cooperation of the Bureau of the Census. This article has been prepared to show the extent and nature of the information which the Bureau is now collecting under the restricted authority given to it by Congress for the work, and also to indicate some of the difficulties of such work.

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One of the difficulties which confront an investigator of the extent of our American water supply business at the outset of his studies is the impracticability of obtaining any complete statistics from all cities at the present time, owing to private ownership of works in from one-fifth to one-fourth of our cities. The private companies do not report to the Bureau of the Census nor are their figures reported in detail to public utility commissions in many of the States. The desirability of obtaining more complete information from both private and public water utilities is recognized by the Bureau of the Census, but it can no nothing without authorization by Congress and Congress is not inclined to give such an authorization at present. Consequently the best that can be done now is to see what the figures which the Bureau is permitted to gather indicate regarding the magnitude of the water supply business. Fortunately all these indications will be under the truth, since the data on which they are based lack figures of the financial operations of private companies.

On January 1, 1918, there were 227 American cities having a population of 30,000 or more. The increase in the number of such cities in the United States has been remarkable. At the time of the first census, 1790, there was just one such city in the country, New York, which barely qualified with its 33,131 inhabitants, not so many as there are in Tulsa, Okla., today. Furthermore, there was little need of such community life as we find today, for a large part of the population was engaged in rural pursuits and our industries were in their babyhood.

By 1850 there were 19 cities having a population of 30,000 or more, and they sheltered 7.3 per cent of the country's whole population. In spite of the effects of the civil war, and perhaps due in a measure to some of the conditions of that period, there was little checking of the relative increase in importance of such cities, for in 1870 there were 44 of them, with 13.5 per cent of the country's population. In 1890 there were 103 such cities with 20 per cent of the country's people living in them and in 1910 there were 184 with 29.7 per cent of the total population of the nation. The later growth is even more significant; in 1915 there were were 204 such cities, in 1917 there were 219 and in 1918 there were 227, with 32.9 per cent of the nation's population living in them. In other words considerably more than one-third of the entire population of the United States is dependent for its existence in decency, to say nothing of comfort, upon the utilities managed by our American water works superintendents, in places large enough to come within this special census class, which is certainly much larger today than it was two years ago.

In what follows the 227 cities having a population of 30,000 or more in 1918 will be termed the "census cities." Even in their case it has been impossible for the Bureau of the Census to secure comparable data from many of them, and there are only 146 cities from which complete statistical information has been obtainable. These 146 will hereafter be termed "complete census cities."

Cost of municipal government. Everybody knows that the cost of operating our cities has increased rapidly, but the actual facts are startling and little appreciated. In 1903 it cost $7.91 per capita to run the United States, and in the 146 complete census cities it cost $24.64 per capita of their population to meet their expenses. In 1909 these figures were $9.89 and $30.33 respectively and in 1913 they were $10.15 and $32.46 respectively. Then the World War began, but it did not affect this country materially, so far as municipal and national expenses are concerned, for some time. In 1915 we spent $10.52 per capita for the national expenses and $34.53 for municipal expenses in the complete census cities, and in 1917 we spent $14.70 and $33.26 respectively.

The fact stands out clearly that in times of peace the per capita government costs of our cities have been increasing more rapidly than those of the nation. Between 1903 and 1915 national per-capita costs increased 33 per cent while similar costs in the complete census cities increased 40 per cent. The Bureau of the Census makes a deduction from these figures which reads as follows:

> These figures disclose at once the greater relative importance in normal times of the proper administration of city affairs and the necessity of such a system of accounting and reporting as will best assist in securing and maintaining economy and efficiency in city government. The necessity of such accounting and reporting is much more pressing in the case of cities than in that of the nation, owing to the greater relative per capita costs of the cities.

With the 1918 report the effect of the World War becomes apparent, for hereafter our national expenses must be heavy, as in European countries. The per capita expenses of the complete census cities in this year were $34.08, an increase of 2½ per cent over 1917, but the per capita national expenses had increased to $89.16, an increase of 506 per cent, a succinct statement of the financial burden of a great war even upon the victors.

Municipal indebtedness. It has been shown that with the rapid growth of cities there is an increasing expense to each resident in their government. Part of the expenses of a city as of the nation are met by incurring debts in one way or another, and here again there are figures which must be considered when making a study of the part played by water works in our municipal affairs.

In 1903 the per capita indebtedness of the 146 complete census cities was $44.71 and that of the nation was $11.44. In 1915 these figures were $77.86 and $10.95 respectively. In 1903 the ratio of per capita municipal to national indebtedness was 3.9 and in 1915 it was 7.1. In 1916 it was over 8, but then the World War began to change the relations. In 1918 the per capita municipal indebtedness was $80.96 while the similar national figure was $104.59.

In this connection the total figures of indebtedness have some significance upon the relative position of water works among municipal activities, because a considerable part of the funded debt of some cities is for water works. It should be said, therefore, that while the net debt of the 146 cities exceeded the net debt of the nation by only 0.9 per cent in 1903, by 1915 it exceeded the national debt by 106 per cent. During this period the population of these 146 cities increased 38.2 per cent and their net indebtedness increased 140.7 per cent, eight times faster than the national debt.

Difficulties in securing comparable data. The Bureau of the Census has found great difficulty in determining the relative financial condition of different municipal activities on account of the lack of uniformity in accounting and for other reasons which it explains as follows:

Inaccurate statements of governmental costs are found in the reports of all cities with public service enterprises, such as water supply and gas supply systems, in which no account is taken of the value of the public utilities furnished other departments by such systems. These inaccurate statements cannot give rise to statistics that are comparable, any more than can the accounts of institutions and parks in the case of cities in which the labor of inmates of institutions is employed without its value being credited to the institution or charged to parks. The inaccurate statements could be corrected by the Bureau of the Census and the basis laid for comparable statistics in the case of these public service enterprises if the data were available for correct estimates. In the case of a few cities the officials in charge of the water supply systems prepare estimates of the value of water furnished, and such estimates are included in the departmental reports, though not in the comptroller's or treasurer's accounts and reports.

It should be stated in this connection that neither in the case of these estimates nor in that of credits which are included in the accounts of a city comptroller of actual payments by a city for water furnished by the water supply system to other branches of the city government is there any great accuracy or comparability, owing to a lack of a well-accepted basis for assigning values to the water furnished by privately owned and municipally owned water supply systems to the departments and offices. The lack of an accepted basis is apparent in the statistics of all other public utility enterprises operated by cities. This condition will continue to make difficult the preparation of accurate and comparable statements of the cost of water and other utilities furnished by public service enterprises to fire departments and other departments until, as a result of general discussion and investigation of the subject, approximately correct values can be assigned to the utilities furnished.

Other difficulties in the way of comparable statistics of public service enterprises exist by reason of the fact that in the case of many of them the cost of making out bills and collecting revenue is included with the cost of collecting revenue other than of these enterprises, and there is no basis in city accounts for comparing the expenses of a municipally owned enterprise, the employees of which make out and collect all bills for services or commodities furnished, with those of a similar enterprise whose bills are made out and collected by one of the general financial officers of the city. The Bureau of the Census has formulated no method by which it is able to overcome the difficulties here mentioned, and to the extent that the local accounts here described are inaccurate the statistics in which their data are incorporated will fail to be strictly comparable as between the several cities.

With a few exceptions, cities do not include depreciation among their expenses, nor do they make other adequate provision for it in their accounts. As a result, their reports exaggerate their outlays or expenditures for additions to their permanent properties and public improvements and understate their current expenses. These exaggerations and understatements can not be overcome by the Bureau of the Census in its efforts to compile accurate statistics of government costs.

Many of the public improvements of cities require several years for their completion, and the cities receive no benefit from their use until completed.

These improvements are constructed from the proceeds of the sale of bonds on which the cities pay interest during the construction period. In commercial accounting interest so paid is always charged to the account of outlay or capital expenditure, and interest is charged as a current cost only after the property constructed comes into service. For only those cities which recognize this principle of good commercial accounting is the Bureau of the Census able to present true statements of the costs of public improvements, and to show also the total interest for the use of credit capital.

When the accounts of governments with the value of their properties and public improvements are properly kept, they contain approximately correct statements of their value in use as determined either by their original cost or the cost of their replacement, less depreciation. When, however, these accounts are improperly kept, they do not contain correct statements, and for that reason lose much of their accounting and administrative importance and cannot be taken as a basis for a correct judgment concerning the financial condition of governments or the results of government methods of constructing and financing improvements.

Few cities have trustworthy records of the cost or present value of their properties; a still smaller number have trustworthy records of the original cost of their public improvements or data for estimating the present cost of replacing them, and few prepare any trustworthy estimates of the probable amount to be realized from their uncollected revenues. Some improvement has been made, however, in this branch of accounting during the last few years. Of the factors bringing about this improvement, one of the most potent has been the repeated attempts made by the Bureau of the Census to secure correct information with reference to the value of governmental properties and public improvements. As a result of the progress made in this field of accounting, the statistics of the value of governmental properties are more trustworthy than formerly, although they are still far from perfect. Unfortunately the same statement does not apply to the statistics of public improvements, the publication of which cannot be resumed until such time as the accounts of the cities justify it.

Receipts and payments. The Bureau of the Census draws a distinction between revenue, which will be termed "receipts" in these notes, and non-revenue receipts,which include receipts in error and accrued interest received on the original issue of city debt obligations and will not be considered as part of the "receipts." It also divided payments by municipalities into two classes, governmental-cost payments which comprise all expenditures other than those of the second class, non-governmental-cost payments, or payments in error, payments of accrued interest on investments purchased, and payments for outlays balanced by amounts credited in outlay accounts. The second class will not be considered in these notes.

In 1918 the actual receipts of the 227 cities were $1,096,175,353, and $27,919,546 was paid by transfer. The actual payments were $1,144,629,589, and $28,066,240 was paid by transfer. The cash in the possession of the cities decreased, therefore, $11,903,928, or 3.8 per cent, leaving a balance on hand on June 30, 1918, of $303,079,588. Of the individual cities, 104 reported an increase in their cash balances and 123 reported a decrease.

These figures have been compiled not only from the accounts of the cities but also from those of other local governmental units covering the same areas, such as school, park, sanitary and water districts, and from the accounts of counties where they collect revenue for municipal purposes. The importance of these statistics is stated as follows by the Bureau:

> Comparisons between revenue receipts and governmental-cost payments are of the greatest significance in municipal finance. If a city is realizing more money from revenue than it is paying for expenses, interest and outlays, it has a balance which may be applied to reducing indebtedness; while if its payments for expenses, interest and outlays are greater than its revenue receipts, the city is increasing its indebtedness. If it is realizing from revenues enough money to pay its expenses and interest, but only a portion of its outlays, it is imposing upon the future a part of the burden of paying for its permanent properties and public improvements. Of the 227 cities covered by this report, 80 realized enough from revenues to meet all their payments for expenses, interest and outlays, and to have a balance available for paying debt. The excess of revenue receipts of these 80 cities over their governmental-cost payments amounted to $22,323,060. New York, N. Y., reported the greatest excess, $4,537,419. The excess of governmental-cost payments over revenue receipts by the 147 cities reporting such excess was $70,923,990. This excess varied from $12,578,980 for Philadelphia, Pa., to $2309 for Quincy, Mass. The net excess of the governmental-cost payments of the 227 municipalities over their revenue receipts was $48,600,930.

Table 1 gives the main facts regarding the changes which have been taking place in the last fifteen years in the per capita revenue receipts and governmental-cost payments for which complete statistics have been obtained. It will be observed that the expenditures for both classes of payments increased about in the same ratio, and that the World War exercised a distinct effect on them, which we all knew to be the case although its definite amount has not previously been recorded. The definitions of the various classes of receipts and payments adopted by the Bureau of the Census in classifying the data summarized in the table are as follows:

> *Expenses of general departments.* Under this heading are tabulated all payments for municipal expenses other than those for the operation and maintenance of public service enterprises.

Expenses of public service enterprises. Under this general head are included the expenses of operating and maintaining water supply and gas supply systems, electric light and power systems, markets, and all other enterprises operated and maintained to supply the inhabitants with public utilities or services.

Municipal outlays. Municipal outlays are the costs of properties, including land, buildings and equipment, and public improvements more or less permanent in character, which are acquired or constructed by municipalities for use in the exercise of their municipal functions or in connection with the business enterprises undertaken by them.

TABLE 1

Summary of per capita net revenue receipts and net governmental-cost payments for specified years in 146 cities

YEAR	PER CAPITA NET REVENUE RECEIPTS			PER CAPITA NET GOVERMENTAL-COST PAYMENTS				
	Total	Other than of public service enterprises	Of public service enterprises	Total	For expenses of general departments	For expenses of public service enterprises	For interest	For outlays
1918	$32.76	$29.41	$3.35	$34.08	$20.64	$1.59	$3.78	$8.07
1917	31.97	28.84	3.13	33.26	19.53	1.39	3.66	8.68
1915	30.00	26.97	3.03	34.53	18.95	1.39	3.58	10.60
1913	28.55	25.74	2.81	32.46	17.67	1.35	3.15	10.29
1911	28.07	25.09	2.98	32.25	16.91	1.26	3.07	11.02
1909	26.42	23.53	2.89	30.33	16.06	1.22	2.86	10.18
1907	24.67	21.90	2.77	29.91	15.84	1.17	2.56	10.34
1905	22.79	20.19	2.60	25.57	13.81	1.07	2.36	8.32
1903	21.14	18.71	2.42	24.64	13.25	1.10	2.06	8.23

In this table there is found one of the first indications of the importance of such statistics to the water works man. It will be observed that in 1903 53.8 per cent of the payments for governmental costs were for the expenses of general departments, 4.5 per cent for expenses of public service enterprises, 8.4 per cent were for interest and 33.4 per cent for outlays. The corresponding percentages for 1918 were 60.6, 4.7, 11.1 and 23.7. In other words the cities have kept on spending just about the same percentage of their total payments for all purposes, on their public utilities in which group water works form the major element. It is of interest to learn, also, from other data collected by the Bureau of the Census that the public utilities owned by the cities have been earning just about the same percentage of the total revenue receipts during the same period, running from a minimum of 9.9 per cent of the total in 1917 to 11.5 per cent in 1903. In 1918 it was 10.2 per cent.

The receipts from public service enterprises in 1918 in the 227 cities were $116,494,645 in all. The various classes of enterprises and their contribution to this total were: Water works, $90,139,705; electric light and power systems, $8,315,960; gas supply systems, $1,418,511; markets and public scales, $1,758,480; docks, wharves and landings, $7,786,509; cemeteries and crematories, $1,049,706; public halls, $172,862; subways for pipes and wires, $311,555; ferries, $1,729,491; toll bridges, $443,874; city farms, $50,798; miscellaneous, $3,317,194. The largest single contribution to the miscellaneous receipts was the municipal railway of San Francisco, which paid in $2,392,236.

During this year the total receipts of the 227 cities were $1,124,094,899. Of this amount $705,723,158 came from the general property tax, then the $90,139,705 from water works, with special assessments third with a contribution of $72,673,785.

Attention is again called to the fact that these figures are more or less misleading, because, in order to form a complete picture of the water supply business in our cities of 30,000 or more population we must add to the figures of the Bureau of the Census the data which can only be obtained from the private water companies operating in them. San Francisco is put down as owning and operating a municipal water works, for example, which is manifestly the fire-protection system operated under high pressure, while the greatly larger works of the Spring Valley Water Company are not recognized. It is impossible to be critical, however, when the Bureau frankly acknowledges the incompleteness of the data it presents and states the reasons, already quoted, for its inability to present more comprehensive figures.

Growth of water supply. In Table 2 is given a summary of the revenue receipts and payments for expenses and outlays of water works in the 146 complete census cities. It will be seen that from 1903 to 1918 inclusive the revenues increased 90.5 per cent and the expenses increased 104.8 per cent. The expenses were 40.6 per cent of the receipts in 1903 and 43.6 per cent in 1918.

The governmental-cost payments for expenses of public service enterprises in 1918 amounted to a total of $55,174,480 in the 227 census cities, of which amount $39,699,280 was spent on water works operation and maintenance, $5,050,679 on the operation and maintenance of electric light and power plants, $1,115,947 on the gas supply systems, $735,081 on markets and public scales, $2,716,738 on docks, wharves and landings, $1,232,974 on cemeteries and crematories, $362,203 of public halls, $11,733 on subways, and $4,249,845 on all other enterprises, the largest item in the last group being $1,476,288 for the operation of the municipal railway of San Francisco.

The property owned by the water works of the 227 cities in 1918 was valued at $1,205,377,311, or practically the same amount that the park and other recreation features of our cities are now estimated to be worth. No other branch of municipal activities even approaches the value of these two groups. The valuation of school property, often considered the most valuable asset of a city, is only two-thirds as large as the average valuation of the water system or the recreation facilities of a city.

TABLE 2

Growth of water supply revenues, payments and outlays in 146 cities during the period 1903–1918

YEAR	REVENUE RECEIPTS	PAYMENTS		
		Total	Expenses	Outlays
1918	$81,884,234	$66,007,480	$35,745,424	$30,262,056
1917	76,964,015	63,918,158	31,885,640	32,032,518
1915	70,599,902	76,609,355	30,217,904	46,391,451
1913	65,317,823	91,276,498	29,227,070	62,049,428
1911	63,610,139	91,968,532	25,882,798	66,085,734
1909	57,105,840	76,452,815	23,519,487	52,933,328
1907	52,712,870	61,760,318	20,827,844	40,932,474
1905	47,396,604	41,581,743	18,677,311	22,904,432
1903	42,986,187	*	17,449,061	*

* Outlays for water supply systems not reported separately.

The funded debt of the water systems in 1918 was $586,555,069, or 48.7 per cent of the valuation. In ten cities the outstanding debt for water supply was in excess of its valuation, which may have been due to the fact that while a heavy bonded indebtedness may have been incurred for new works, the latter were unfinished and consequently had not been valued at their ultimate worth.